

East Coast Railway

Question Paper

Examination for the Group –C JE (Mechanical) Post

Date of examination: 12.04.2021

Total Marks : 150

Time : 2 Hrs

Please read the following instructions carefully before you begin to answer the questions

1. Question Paper consists of 150 questions.
2. Question Paper has two sections A & B. Participant has to attempt both sections.
3. All questions are objective type. There shall be 4 options against each question.
4. Participant has to choose only one option as answer.
5. Each question carries one mark. For every correct answer, 1 mark will be allotted to Examinee.
6. No Negative marking is there for wrong answer. Examinee can attempt/answer all the questions.
7. Qualifying mark is 60% or above.
8. Only use blue or black ball point pen only. The use of pencil is not valid.
9. Candidates using unfair means will be removed from the selection process.
10. Cutting, overwriting, erasing or alteration of any type in answer will not be accepted and zero marks will be given for answer having correction/ overwriting.
11. Examinee is advised to go through the complete questions within 15 min of start of examination for any doubts clarification.
12. The examinees are not allowed to bring mobile phones / calculator / electronic gadgets with them to the examination hall. Use of any paper, calculating machines and mobile phones etc. is completely prohibited and they will be disqualified for using it.

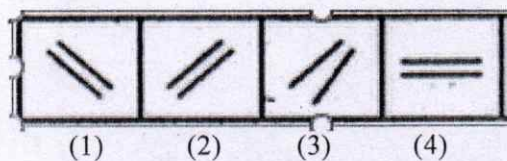
SECTION A :

1. One micron is equal to []
A. 1mm
B. 0.1mm
C. 0.01mm
D. 0.001mm
2. A feeler gauge is used to check []
A. Radius
B. Screw pitch
C. Surface roughness
D. clearance between two parts
3. Time elapsed from the date of realization of need of recoupment to the physical receipt of material is termed as []
A. Buffer time
B. Interim period
C. Contract period
D. Lead time
4. For household wiring and small units, the following should be used for safety measure []
A. MCB
B. ACB
C. OCB
D. MCCB
5. Decibel (db) is a unit used to measure []
A. Light
B. Sound
C. Frequency
D. None of the above
6. Class-A fire consists of fire due to []
A. Wood
B. Oil
C. Transformer
D. Chemical
7. The following class of fire occur in electrical equipment []
A. Class-A fires
B. Class-B fires
C. Class-C fires
D. All of the above
8. The type of bearing that can carry thrust and radial loads is? []
A. tapered roller
B. loose needle roller

- C. staggered roller
D. cylindrical roller
9. Lathe mandrels can be termed as a? []
A. Gauge
B. Jig
C. Template
D. Fixture
10. The chief alloying elements of stainless Steel are? []
A. Chromium and nickel
B. Chromium and tungsten
C. Nickel and vanadium
D. Nickel and tungsten
11. While drilling in lathe, the drill is held in the? []
A. bed
B. compound rest
C. tailstock
D. headstock
12. The best position to hold the job in the vice when filing is []
A. Eye level
B. Shoulder level
C. Elbow level
D. Arm level
13. Which one of the following threads, is used on mechanical jack []
A. Acme
B. Square
C. Butress
D. B.S.F.
14. A flag pole 12 m high casts a shadow 9 m long. Find the distance of the top of the pole from the far end of the shadow. []
A. 12
B. 13
C. 13.5
D. 15
15. During conversion without pressure application of a solid from one shape to another, the volume of the new shape will []
a. increase
b. decrease
c. remain unaltered
d. be doubled
16. The average of the first five multiples of 9 []
a. 20
b. 27
c. 28

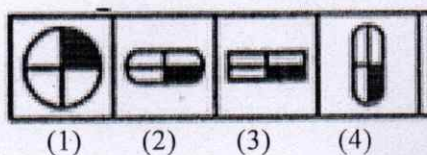
- d. 30
17. The average age of three boys is 15 years, if their ages are in the ratio of 3:5:7, then the age of the youngest boy is []
a. 21
b. 18
c. 15
d. 9
18. If A and B together can complete a piece of work in 15 days and B alone in 20 days, in how many days can A alone complete this work ? []
a. 60
b. 45
c. 40
d. 30
19. A sells an article to B at a profit of 10%, B sells back the article to A at a loss of 10%, in this transaction []
a. A neither loses nor gains
b. A makes a profit of 11%
c. A makes a profit of 20%
d. loses 20%
20. The sum of ages of 5 children born at the intervals of 3 years each is 50 years. What is the age of youngest child? []
a. 4 years
b. 8 years
c. 10 years
d. 16 years
21. What is the average of the numbers: 0, 0, 4, 10, 5, and 5 ? []
a. 2
b. 3
c. 4
d. 5
22. What kind of data can you send by e-mail? []
a. Audio
b. Pictures
c. Video
d. All of the above
23. The download speed of your net access is defined in terms of: []
a. Ram
b. MHz
c. Kbps
d. Megabytes

24. Choose the figure which is different from the rest. []



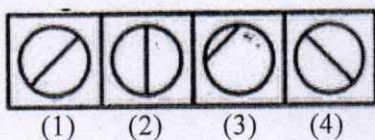
- a. 1
b. 2
c. 3
d. 4

25. Choose the figure which is different from the rest. []



- a. 1
b. 2
c. 3
d. 4

26. Choose the figure which is different from the rest. []



- a. 1
b. 2
c. 3
d. 4

27. Select a suitable figure from the Answer Figures that would replace the question mark (?). []

Problem Figures:



Answer Figures:



(A) (B) (C) (D)

28. Identify the figure that completes the pattern. []



(X)



(1)



(2)



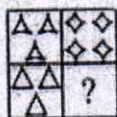
(3)



(4)

- a. 1
b. 2
c. 3
d. 4

29. Identify the figure that completes the pattern. []



(X)



(1)



(2)



(3)



(4)

- a. 1
b. 2
c. 3
d. 4

30. Choose the alternative which is closely resembles the mirror image of the given combination. []

ANS43Q12

(1) ANS43Q12

(3) 2NAE4Q51

(2) 51Q342NA

(4) 12Q43ANS

- a. 1
b. 2
c. 3
d. 4

31. Choose the alternative which is closely resembles the mirror image of the given combination. []

MALAYALAM

(1) MALAYALAM

(3) MALAYALAM

(2) MAJAYAJAM

(4) MAGAYAGAM

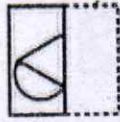
- a. 1
b. 2
c. 3

d. 4

32. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line. []



(X)



(1)



(2)



(3)



(4)

- a. 1
b. 2
c. 3
d. 4

33. Look at this series 2, 1, $1/2$, $1/4$, ----. What number comes next? []

- a. $1/3$
b. $1/8$
c. $2/8$
d. $1/16$

34. Look at this series 7, 10, 8, 11, 9, 12, ---- what number comes next? []

- a. 7
b. 10
c. 12
d. 13

35. Look at this series: 5.2, 4.8, 4.4, 4, ... What number should come next? []

- a. 3
b. 3.3
c. 3.5
d. 3.6

36. In which script is the Official Language Hindi written? []

- a. English
b. Sanskrit
c. Devnagari
d. Urdu

37. Five children take part in the tournament. Each one has to play every other one. How many games must they play? []

- a. 8
b. 10
c. 24
d. 30

38. Reena is twice as old as Sunita. Three years ago, she was three times as old as Sunita. How old is

Reena now ?

[]

- a. 6
- b. 7
- c. 8
- d. 12

39. Volumes of two cubes are in the ratio 8:27. Ratio of their surface area is

[]

- A. 2 : 3
- B. 3 : 2
- C. 4 : 9
- D. 9 : 4

40. If A and B are in the ratio 3 : 4 and B and C are in the ratio 12 : 13, then A and C will be in the ratio

[]

- A. 3 : 13
- B. 9 : 13
- C. 36 : 13
- D. 13 : 9

41. Lord Buddha made his first sermon at

[]

- A. Sarnath
- B. Pataliputra
- C. Kapilavasthu
- D. Lumbini Gardens

42. The Indian National Congress was founded by

[]

- A. Mahatma Gandhi
- B. Annie Besant
- C. W.C.Bannerji
- D. A.O.Hume

43. The Paithan (Jayakwadi) Hydro-electric project, completed with the help of Japan, is on the river

[]

A. Ganga

- B. Cauvery
- C. Narmada
- D. Godavari

44. The southernmost point of peninsular India, that is, Kanyakumari, is []

- A. north of Tropic of Cancer
- B. south of the Equator
- C. south of the Capricorn
- D. north of the Equator

45. Which of the following factors are responsible for the rapid growth of sugar production in south India as compared to north India? []

- I. Higher per acre field of sugarcane
- II. Higher sucrose content of sugarcane
- III. Lower labour cost
- IV. Longer crushing period

- A. I and II
- B. I, II and III
- C. I, III and IV
- D. I, II and IV

46. Which of the following is a non metal that remains liquid at room temperature? []

- A. Phosphorous
- B. Bromine
- C. Chlorine
- D. Helium

47. Which of the following metals forms an amalgam with other metals? []

- A. Tin
- B. Mercury
- C. Lead
- D. Zinc

48. Which of the following is NOT written by Munshi Premchand? []

- A. Gaban

- B. Godan
- C. Guide
- D. Manasorovar

49. Which of the following books has been written by Vikram Seth?

[]

- A. My God Died Young
- B. Islamic Bomb
- C. Look Back in Anger
- D. A Suitable Boy

50. Where is the Railway Staff College located?

[]

- A. Pune
- B. Allahabad
- C. Vadodara
- D. Delhi

51. Bijapur is known for its

[]

- A. severe drought condition
- B. Gol Gumbaz
- C. heavy rainfall
- D. statue of Gomateswara

52. The members of the Rajya Sabha are elected by

[]

- A. the people
- B. Lok Sabha
- C. elected members of the legislative assembly
- D. elected members of the legislative council

53. The present Lok Sabha is the

[]

- A. 14th Lok Sabha
- B. 15th Lok Sabha
- C. 16th Lok Sabha
- D. 17th Lok Sabha

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- D. 17th Lok Sabha

54. The intersecting lines drawn on maps and globes are

[]

- A. latitudes
- B. longitudes
- C. geographic grids
- D. None of the above

55. 'OS' computer abbreviation usually means ?

[]

- A. Order of Significance
- B. Open Software
- C. Operating System
- D. Optical Sensor

56. Who was known as Iron man of India?

[]

- A. Govind Ballabh Pant
- B. Jawaharlal Nehru
- C. Subhash Chandra Bose
- D. Sardar Vallabhbhai Patel

57. The Indian to beat the computers in mathematical wizardry is

[]

- A. Ramanujam
- B. Rina Panigrahi
- C. Raja Ramanna
- D. Shakunthala Devi

58. ICICI is the name of a

[]

- A. chemical industry
- B. bureau
- C. corporation
- D. financial institution

59. In the last one decade, which one among the following sectors has attracted the highest foreign direct investment inflows into India?

[]

- A. Chemicals other than fertilizers
- B. Services sector
- C. Food processing

D. Telecommunication

60. 'Natya - Shastra' the main source of India's classical dances was written by

[]

A. Nara Muni

B. Bharat Muni

C. Abhinav Gupt

D. Tandu Muni

Section B :

1. The correct sequence of machining operations to be performed to finish a large diameter through hole is []
(A) drilling, boring, reaming
(B) boring, drilling, reaming
(C) drilling, reaming, boring
(D) boring, reaming, drilling
2. Maximum combustion pressure in a gas turbine is.....as compared to diesel engine []
A. Same
B. Less
C. More
D. None of the above
3. During normalizing process of steel, the specimen is heated : []
(A) between the upper and lower critical temperature and cooled in still air.
(B) above the upper critical temperature and cooled in furnace.
(C) above the upper critical temperature and cooled in still air.
(D) between the upper and lower critical temperature and cooled in furnace
4. Peaucellier mechanism has..... []
A. 8 links
B. 6 links
C. 4 links
D. 12 links
5. Match the following metal forming processes with their associated stresses in the work piece. Metal forming process Types of stress []

1. Coining	P. Tensile
2. Wire Drawing	Q. Shear
3. Blanking	R. Tensile and compressive
4. Deep Drawing	S. Compressive

(A) 1-S, 2-P, 3-Q, 4-R
(B) 1-S, 2-P, 3-R, 4-Q
(C) 1-P, 2-Q, 3-S, 4-R
(D) 1-P, 2-R, 3-Q, 4-S
6. In abrasive jet machining, as the distance between the nozzle tip and the work surface increases, the material removal rate []
(A) increases continuously.
(B) decreases continuously.
(C) decreases, becomes stable and then increases.
(D) increases, becomes stable and then decreases

7. Green sand mould indicates that []
 (A) polymeric mould has been cured (B) mould has been totally dried
 (C) mould is green in color (D) mould contains moisture
8. Eigen values of a real symmetric matrix are always []
 (A) positive (B) negative
 (C) real (D) complex
9. Heat and work are []
 (A) intensive properties (B) extensive properties
 (C) point functions (D) path functions
10. The operation in which oil is permeated into the pores of a powder metallurgy product is known as []
 (A) mixing (B) sintering
 (C) impregnation (D) infiltration
11. If a mass of moist air in an airtight vessel is heated to a higher temperature, then []
 (A) specific humidity of the air increases
 (B) specific humidity of the air decreases
 (C) relative humidity of the air increases
 (D) relative humidity of the air decreases
12. The crystal structure of austenite is []
 (A) body centred cubic (B) face centred cubic
 (C) hexagonal closed packed (D) body centred tetragonal
13. Which one among the following welding processes uses non-consumable electrode []
 (A) Gas metal arc welding (B) Submerged arc welding
 (C) Gas tungsten arc welding (D) Flux coated arc welding
14. A thin cylinder of inner radius 500 mm and thickness 10 mm is subjected to an internal pressure of 5 MPa. The average circumferential (hoop) stress in MPa is []
 (A) 100 (B) 250
 (C) 500 (D) 1000
15. The word 'kanban' is most appropriately associated with []
 (A) economic order quantity (B) just-in-time production
 (C) capacity planning (D) product design
16. The surface considered for Gauss's law is called []
 (a) Closed surface
 (b) Spherical surface
 (c) Gaussian surface
 (d) Plane surface
17. The force per unit charge is known as []
 (a) electric flux
 (b) electric field

- (c) electric potential
- (d) electric current

18. Electric field lines provide information about

[]

- (a) field strength
- (b) direction
- (c) nature of charge
- (d) all of these

19. Which of the following pairs has the same dimensions?

[]

- (a) specific heat and latent heat
- (b) Impulse and momentum
- (c) surface tension and force
- (d) moment of Inertia and torque

20. In a gas turbine, high thermal efficiency is obtained in.....

[]

- A. Closed cycle
- B. Open cycle
- C. In both the cycles
- D. All the above cycles

21. The dimensions of kinetic energy is same as that of

[]

- (a) force
- (b) pressure
- (c) work
- (d) momentum

22. Light year is a unit of

[]

- (a) time
- (b) distance
- (c) sunlight intensity
- (d) mass

23. Resolution is

[]

- (a) a measure of the bias in the instrument
- (b) None of these
- (c) the smallest amount of input signal change that the instrument can detect reliably
- (d) a measure of the systematic errors

24. The displacement in metres of a body varies with time t in second as $y = t^2 - t - 2$. The displacement is zero for a positive of t equal to

[]

- (a) 1 s
- (b) 2 s
- (c) 3 s
- (d) 4 s

25. A body starts from rest and travels with an acceleration of 2 m/s^2 . After t seconds its velocity is 10 m/s . Then t is

[]

- (a) 10 s

- (b) 5 s
- (c) 20 s
- (d) 6 s

26. The mass of a body which is equal to the ratio of the force acting on a body to the acceleration produced in the body is

[]

- (a) the gravitational mass
- (b) the electromagnetic mass
- (c) the internal mass
- (d) the inertial mass

27. The force required to produce an acceleration of 2 m/s^2 on a mass of 2 kg is

[]

- (a) 4 N
- (b) 10 N
- (c) 22 N
- (d) 18 N

28. A passenger in a moving bus is thrown forward when the bus is suddenly stopped. This is explained

[]

- (a) by Newtons first law
- (b) by Newtons second law
- (c) by Newtons third law
- (d) by the principle of conservation of momentum

29. A block of wood is placed on a surface. A force is applied parallel to the surface to move the body. The frictional force developed acts

[]

- (a) normal to the surface upwards
- (b) normal to the surface downwards
- (c) along the direction of the applied force
- (d) opposite to the direction of the applied force

30. The frame of reference attached to a satellite of the earth is

[]

- (a) an inertial frame
- (b) an absolute frame at rest with respect to the stars
- (c) a non – inertial frame
- (d) a gravitational frame

31. Moment of inertia depends on

[]

- (a) Distribution of particles
- (b) Mass
- (c) Position of axis of rotation
- (d) All of these

32. If a body is rotating about an axis, passing through its centre of mass then its angular momentum is directed along its

[]

- (a) Radius
- (b) Tangent
- (c) Circumference
- (d) Axis of rotation

33. A particle moves on a circular path with decreasing speed. Choose the correct statement. []
- Angular momentum remains constant.
 - Acceleration is towards the centre.
 - Particle moves on a spiral path with decreasing radius.
 - The direction of angular momentum remains constant.
34. A dancer on ice spins faster when she folds her arms. This is due to []
- Increases in energy and increase in angular momentum
 - Decrease in friction at the skates
 - Constant angular momentum and increase in kinetic energy
 - Increase in energy and decrease in angular momentum
35. An isolated particle of mass m is moving in a horizontal plane (x - y), along the x -axis, at a certain height above the ground. It suddenly explodes into two fragments of masses $m/4$ and $3m/4$. An instant later, the smaller fragment is at $y = +15$ cm. The larger fragment at this instant is at []
- $y = -5$ cm
 - $y = +20$ cm
 - $y = +5$ cm
 - $y = -20$ cm
36. A body of mass 10 kg is moved parallel to the ground, through a distance of 2 m. The work done against gravitational force is []
- 196 J
 - 196 J
 - 20 J
 - zero
37. A man of 60 kg weight is standing at rest on a platform. He jumps up vertically a distance of 1 m and the platform at the same instant moves horizontally forward with the result that the man lands 1 meter behind the point on the platform from where he took the jump. The total work done by the man at the instant he lands is []
- 300 J
 - 150 J
 - 600 J
 - zero
38. When the linear momentum of a particle is increased by 1% its kinetic energy increases by $x\%$. When the kinetic energy of the particle is increased by 300%, its linear momentum increases by $y\%$. The ratio of y to x is []
- 300
 - 150
 - 100
 - 50
39. Hooke's law essentially defines []
- Stress
 - Strain
 - Yield point
 - Elastic limit

40. Longitudinal strain is possible in the case of []
(a) Gases
(b) Liquid
(c) Only solids
(d) Only gases & liquids
41. Out of the following materials, whose elasticity is independent of temperature? []
(a) Copper
(b) Invar steel
(c) Brass
(d) Silver
42. The ratio of the change in dimension at right angles to the applied force to the initial dimension is known as []
(a) Youngs modulus
(b) Poissons ratio
(c) Lateral strain
(d) Shearing strain
43. When the intermolecular distance increases due to tensile force, then []
(a) There is no force between the molecules
(b) There is a repulsive force between the molecules
(c) There is an attractive force between the molecules
(d) There is zero resultant force between the molecules
44. An iron bar of length l m and cross section A m² is pulled by a force of F Newton from both ends so as to produce an elongation in meters. Which of the following statement statements is correct []
(a) Elongation is inversely proportional to length l
(b) Elongation is directly proportional to cross section A
(c) Elongation is inversely proportional to A
(d) Elongation is directly proportional to Youngs modulus
45. Plants get water through the roots because of []
(a) Capillarity
(b) Viscosity
(c) Gravity
(d) Elasticity
46. At critical temperature, the surface tension of a liquid []
(a) Is zero
(b) Is infinity
(c) Is the same as that at any other temperature
(d) Cannot be determined
47. The surface of water in contact with glass wall is []
(a) Plane
(b) concave

- (c) convex
- (d) Both b and c

48. If the surface of a liquid is plane, then the angle of contact of the liquid with the walls of container is []
- (a) Acute angle
 - (b) Obtuse angle
 - (c) 90°
 - (d) 0°
49. Absorptive power of perfectly black body is []
- (a) Zero
 - (b) Infinity
 - (c) One
 - (d) Constant
50. For which of the following process, the thermal conduction is maximum? []
- (a) Combustion
 - (b) Radiation
 - (c) Convection
 - (d) Conduction
51. The good absorber of heat are []
- (a) Non-emitter
 - (b) Poor-emitter
 - (c) Good-emitter
 - (d) Highly polished
52. A person with dark skin as compared to a person with white skin will experience []
- (a) Less heat and less cold
 - (b) More heat and more cold
 - (c) More heat and less cold
 - (d) Less heat and more cold
53. The best ideal black body is []
- (a) Lamp of charcoal heated to high temperature
 - (b) Metal coated with a black dye
 - (c) Glass surface coated with coalter
 - (d) Hollow enclosure blackened inside and having a small hole
54. The process of heat transfer in which heat is transferred with actual migration of medium particles is known as (AFMC-94) []
- (a) Conduction
 - (b) Convection
 - (c) Radiation
 - (d) Reflection
55. A surface at temperature $T_0^\circ\text{K}$ receives power P by radiation from a small sphere at temperature $T \gg T_0$ and at a distance d . if both T and d are doubled, the power received by surface will becomes

approximately

[]

- (a) P
- (b) 2p
- (c) 4p
- (d) 16p

56. A thermodynamical system is changed from state (P^1, V^1) to (P^2, V^2) by two different processes, the quantity which will remain same is: []

- (a) ΔQ
- (b) ΔW
- (c) $\Delta Q + \Delta W$
- (d) $\Delta Q - \Delta W$

57. At a given volume and temperature, the pressure of a gas []

- (a) varies inversely as its mass
- (b) varies inversely as the square of its mass
- (c) varies linearly as its mass
- (d) is independent of its mass

58. The translational kinetic energy of gas molecules at temperature T for one mole of a gas is []

- (a) $(3/2) RT$
- (b) $(9/2) RT$
- (c) $(1/3) RT$
- (d) $(5/2) RT$

59. Which of the following parameters dose not characterize the thermodynamic state of matter? []

- (a) work
- (b) volume
- (c) pressure
- (d) Temperature

60. Heat cannot by itself flow from a body at lower temperature to a body at higher temperature is a statement as a consequence of []

- (a) conservation of mass
- (b) conservation of momentum
- (c) first law of thermodynamics
- (d) second law of thermodynamics

61. Which of the following statements is correct for any thermodynamic system? []

- (a) The internal energy changes in all processes.
- (b) Internal energy and entropy are state functions.
- (c) The change in entropy can never be zero.
- (d) The work done in an adiabatic process is always zero.

62. Real gases show mark able deviation from that of ideal gas behavior at []

- (a) High temperature and low pressure
- (b) Low temperature and high pressure

- (c) High temperature and high pressure
- (d) Low temperature and low pressure

63. Moon has no atmosphere because []
(a) It is far away from the surface of the earth
(b) Its surface temperature is 10°C
(c) The r.m.s. velocity of all the gas molecules is more than the escape velocity of the moon's surface
(d) The escape velocity of the moon's surface is more than the r.m.s. velocity of all molecules
64. Energy supplied to convert unit mass of substance from solid to liquid state at its melting point is called []
(a) Latent heat of fusion
(b) Evaporation
(c) Solidification
(d) Latent heat of fission
65. An ideal gas is that which can []
(a) Be solidified
(b) Liquefied
(c) Not be liquefied
(d) Not be solidified
66. The specific heat of a gas []
(a) Has only one value
(b) Has two values C_P and C_V
(c) Is proportional to the square root of its absolute temperature
(d) Can have any value between 0 and infinity
67. Following gases are kept at the same temperature. Which gas possesses maximum r.m.s. speed? []
(a) Oxygen
(b) Nitrogen
(c) Hydrogen
(d) Carbon dioxide
68. According to kinetic theory of gases, at absolute zero of temperature []
(a) Water freezes
(b) Liquid helium freezes
(c) Molecular motion stops
(d) Liquid hydrogen freezes
69. For a magnet of time period T magnetic moment is M , if the magnetic moment becomes one fourth of the initial value, then the time period of oscillation becomes. []
(a) Half of initial value
(b) One fourth of initial value
(c) Double of initial value
(d) Four times initial value

70. One of the two clocks on the earth is controlled by a pendulum and other by a spring. If both the clocks are taken to the moon, then which clock will have the same time – period of the earth? []
- (a) spring clock
 - (b) pendulum clock
 - (c) both
 - (d) none
71. If a hole is bored along the diameter of the earth and a stone is dropped into the hole []
- (a) The stone reaches the centre of the earth and stops there
 - (b) The stone reaches the other side of the earth and stops there
 - (c) The stone executes simple harmonic motion about the centre of the earth
 - (d) The stone reaches the other side of the earth and escapes into space
72. With the increase in temperature, the frequency of the sound from an organ pipe []
- (a) Decreases
 - (b) Increases
 - (c) Remain unchanged
 - (d) Changes erratically
73. Energy is not carried by []
- (a) Longitudinal progressive waves
 - (b) Electromagnetic waves
 - (c) Transverse progressive waves
 - (d) Stationary wave
74. String is in fundamental mode of vibration then velocity is directly proportional to _____ []
- (a) Square root of tension
 - (b) Square root of length
 - (c) Square of tension
 - (d) Square root of linear density
75. Region without free electrons and holes in a p-n junction is []
- (a) n-region
 - (b) p-region
 - (c) depletion region
 - (d) none of these
76. What happens during regulation action of a Zener diode? []
- (a) The current through the series resistance (R_s) changes.
 - (b) The resistance offered by the Zener changes.
 - (c) The Zener resistance is constant.
 - (d) Both (a) and (b)
77. At absolute zero, Si acts as a []
- (a) metal
 - (b) semiconductor
 - (c) insulator
 - (d) none of these

78. In good conductors of electricity the type of bonding that exist is []
(a) Van der Waals
(b) covalent
(c) ionic
(d) metallic
79. The dominant mechanism for motion of charge carriers in forward and reverse biased silicon p-n junction are []
(a) drift in forward bias, diffusion in reverse bias
(b) diffusion in forward bias, drift in reverse bias
(c) diffusion in both forward and reverse bias
(d) drift in both forward and reverse bias
80. The first model of atom in 1898 was proposed by []
(a) Ernst Rutherford
(b) Albert Einstein
(c) J.J. Thomson
(d) Niels Bohr
81. In the Geiger-Marsden scattering experiment, in case of head-on collision the impact parameter should be []
(a) maximum
(b) minimum
(c) infinite
(d) zero
82. Cathode rays were discovered by []
(a) Maxwell Clerk James
(b) Heinrich Hertz
(c) William Crookes
(d) J.J. Thomson
83. The maximum value of photoelectric current is called []
(a) base current
(b) saturation current
(c) collector current
(d) emitter current
84. The earth behaves as a magnet with magnetic field pointing approximately from the geographic []
(a) North to South
(b) South to North
(c) East to West
(d) West to East
85. Which of the following property shows the property of ferromagnetic substances? []
(a) The ferromagnetic property depends on temperature.
(b) The ferromagnetic property does not depend on temperature.

- (c) At high enough temperature ferromagnet becomes a diamagnet.
(d) At low temperature ferromagnet becomes a paramagnet.
86. In an alternating current circuit consisting of elements in series, the current increases on increasing the frequency of supply. Which of the following elements are likely to constitute the circuit? []
- (a) Only resistor
(b) Resistor and inductor
(c) Resistor and capacitor
(d) Only inductor
87. Quality factor and power factor both have the dimensions of []
- (a) time
(b) frequency
(c) work
(d) angle
88. A transformer works on the principle of []
- (a) self induction
(b) electrical inertia
(c) mutual induction
(d) magnetic effect of the electrical current
89. In nuclear reaction, there is conservation of []
- (a) mass only
(b) energy only
(c) momentum only
(d) mass, energy and momentum
90. The number of beta particles emitted by a radioactive substance is twice the number of alpha particles emitted by it. The resulting daughter is an []
- (a) isomer of parent
(b) isotone of parent
(c) isotope of parent
(d) isobar of parent